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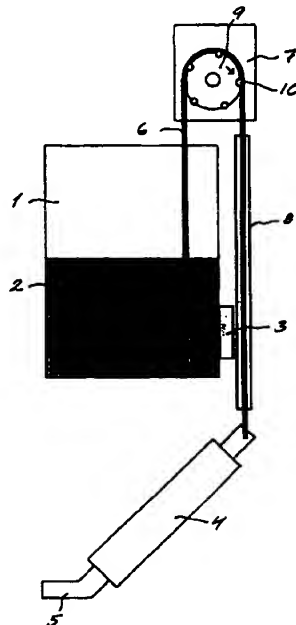


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/SE96/01369 (22) International Filing Date: 24 October 1996 (24.10.96) (30) Priority Data: 9503755-2 24 October 1995 (24.10.95) SE (71)(72) Applicant and Inventor: SMEDS, Stig-Eric [SE/SE]; Aldersbo, S-733 98 Ransta (SE). (74) Agent: STOLT, Lars, C.; L.A. Groth & Co. KB, P.O. Box 6107, S-102 32 Stockholm (SE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>In English translation (filed in Swedish).</i>

(54) Title: DEVICE FOR FEEDING OF YOUNG ANIMALS**(57) Abstract**

An automatic feeder for delivering fluid nutrients (2) to young animals, comprising a refrigerated container (1) for nutrient fluid, dispensing means (7) for metering nutrient fluid (2) to at least one teat-like nozzle (5) accessible to the animals, through the medium of an outfeeder (4) upon initiation of an animal-controlled activator, wherein the outfeeder (4) has a thermistor-controlled heating element (13) for heating nutrient fluid (2) to an appropriate temperature when dispensing fluid nutrient, and for drying the outfeeder (4) subsequent to dispensing the fluid. The outfeeder (4) is connected to the refrigerated container (1) by a hose (6) which projects down into the fluid nutrient (2) and which is included in a peristaltic pump (7) that forms said feeding means, wherein the end of the hose (6) that lies proximal to the outfeeder (4) projects into the end of the outfeeder (4) that lies distal to the nozzle (5) in the absence of a fixed coupling with the outfeeder (4).



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DEVICE FOR FEEDING OF YOUNG ANIMALS

5 The present invention relates to an automatic feeder of the kind defined in the preamble of Claim 1 for delivering nutrient fluids to young animals.

10 An automatic feeder of this kind is described in SE-B 445 873, for instance. The object of the present invention is to simplify this construction, such as to simplify manufacture and maintenance. Among other things, it shall be possible to readily
15 replace and clean the conduits through which nutrient fluid is conducted. Furthermore, the means for dispensing portions of nutrient fluid from the coolant container to the outfeeder shall be simple and functionally reliable in the absence of complicated mechanisms. This object is achieved with an automatic feeder constructed in accordance with the invention and having the characteristic features set forth in the following Claims.

20 An inventive automatic feeder will now be described with reference to the accompanying drawings, in which

Fig. 1 is a schematic vertical view of an inventive automatic feeder;

25 Fig. 2 is a vertical sectional view of the outfeeder in its longitudinal direction;

Fig. 3 is a sectional view illustrating the outfeeder at right angles to the view in Fig. 2; and

30 Fig. 4 is a side view of the outfeeder when loosening the outfeeder from the automatic feeder.

Fig. 1 illustrates schematically an automatic feeder having a

refrigerated container 1 for nutrient fluid 2. The refrigerated container 1 is cooled by cooling means 3. The container 1 is connected to at least one outfeeder or dispenser 4. These outfeeders will suitably be four in number, for instance. The outfeeder 4 discharges into a teat-like nozzle 5. Portions of nutrient fluid 2 are dispensed from the container 1 to the outfeeder 4 through feed means in the form of a hose 6 whose one end is submerged in nutrient fluid 2 and the other end of which projects into the outfeeder 4. The hose 6 is included in a peristaltic pump 7, also called a hose pump. The hose 6 is embraced by a guide tube 8.

The peristaltic pump 7 is operated by squeezing the hose 6 at given mutually equidistant points by means of a rotating wheel 9 provided with hose squeezing devices 10. The fluid volumes enclosed between the hose squeezing points 10 are displaced as the wheel 9 rotates, thereby generating through the hose 6 a well-defined and controllable stream of nutrient fluid.

The outfeeder 4 is shown in more detail in Figs. 2 and 3. The outfeeder 4 is comprised of an inner fluid transporting pipe 11 and an outer pipe 12. The inner pipe 11 is surrounded by a heating element 13. Diverse temperature control means are also provided, these means requiring no detailed description.

The outfeeder 4 is held firmly in a holder 14 which is, in turn, journaled on trunnions 15 in an attachment 16 so as to be able to swing downwards about said trunnions. The outfeeder 4 is spring-biased in an upward direction during this swinging or pivotal movement. The outfeeder 4 is held in the holder 14 in an upwardly open recess 18 for receiving pegs 19 on the outfeeder 4. The outfeeder 4 can be freed from the holder 14 and readily replaced in its entirety, by lightly swinging the outfeeder 4 up beyond its normal pivot range and lifting the pegs 19 from the

recess 18. This is illustrated particularly in Fig. 4, in which the arrow 17 illustrates the withdrawal direction.

As evident from Figs. 2 and 3, that end of the inner pipe 11 which lies distal to the nozzle 5 is cut obliquely. This enables the hose 6 arriving from above to discharge freely into the tube end 20 and therewith obviate the need of a coupling between the hose and the pipe. Thus, coupling of the outfeeder 5 to the holder 14 through the medium of the recess 18 and the pegs 19 is a true quick-coupling.

When, for instance, a pig grips the teat-like nozzle 5 and swings the outfeeder down against the spring bias, there is initiated an activator which starts the pump 7 which feeds fluid through the hose 6 to the outfeeder 4. This nutrient fluid 2 is in a chilled state, but will now be warmed to an appropriate temperature by the heating element 13, said element being thermistor-controlled. The outfeeder 4 is also dried by the heating element subsequent to dispensing fluid. The illustrated inventive embodiment provides a simple and easily managed automatic feeder with which the highest hygiene requirements can be satisfied. For instance, the hose 6 can be easily replaced and cleaned in its entirety. Furthermore, the outfeeder 4 can be readily removed and cleaned by virtue of its quick-coupling. The highest requirements on hygiene and manageability are therewith satisfied.

CLAIMS

1. An automatic feeder for delivering fluid nutrients (2) to young animals, comprising a refrigerated container (1) for nutrient fluid, dispensing means (7) for metering nutrient fluid (2) to at least one teat-like nozzle (5) accessible to the animals, through the medium of an outfeeder (4) upon initiation of an animal-controlled activator, wherein the outfeeder (4) has a thermistor-controlled heating element (13) for heating nutrient fluid (2) to an appropriate temperature when dispensing fluid nutrient, and for drying the outfeeder (4) subsequent to dispensing said fluid, characterized in that the outfeeder (4) is connected to the refrigerated container (1) by a hose (6) which projects down into the fluid nutrient (2) and which forms part of a peristaltic pump (7) that forms said feeding means, wherein the end of the hose (6) that lies proximal to the outfeeder (4) projects into the end of the outfeeder (4) that lies distal to said nozzle (5) in the absence of a fixed coupling with the outfeeder (4).

2. An automatic feeder according to Claim 1, characterized in that the outfeeder (4) is supported in the proximity of its end (20) that lies distal from the nozzle (5) in a holder (14) which is journaled on a shaft (14) extending transversely to the outfeeder, for animal-activated downward pivotal movement of the outfeeder (4) against the action of a spring such as to initiate said activator.

3. An automatic feeder according to Claim 2, characterized in that the outfeeder (4) includes two mutually opposing, axial pegs (19), each of which rests in an individual, upwardly open recess (18) in the holder (14), such that the pegs (19) will leave said recesses (18) upon upward swinging of the outfeeder (4), such as to enable said outfeeder to be drawn from the holder (14) and leave said end of the hose (6).

Fig. 1

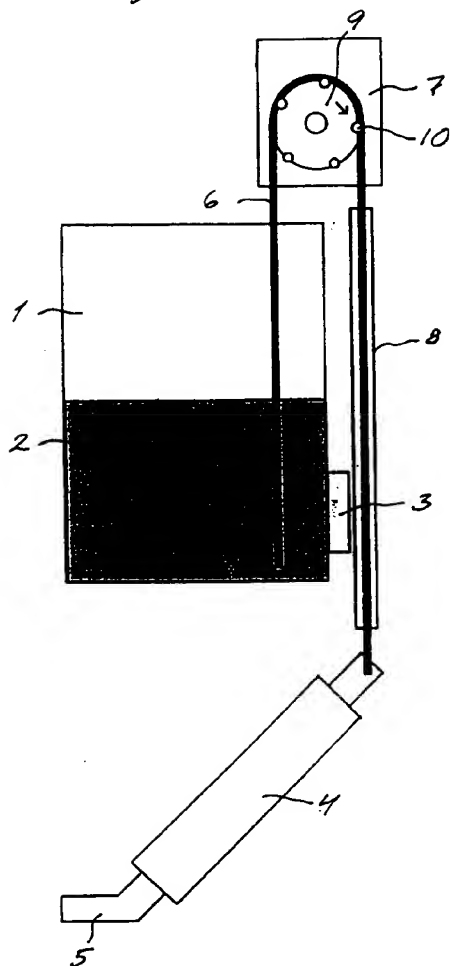


Fig. 2

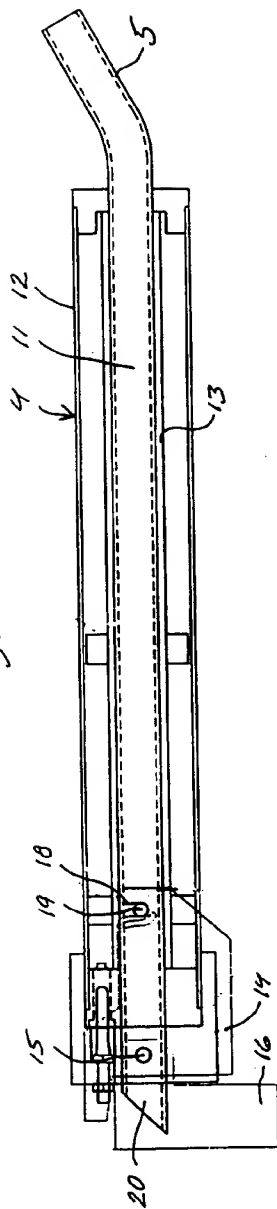
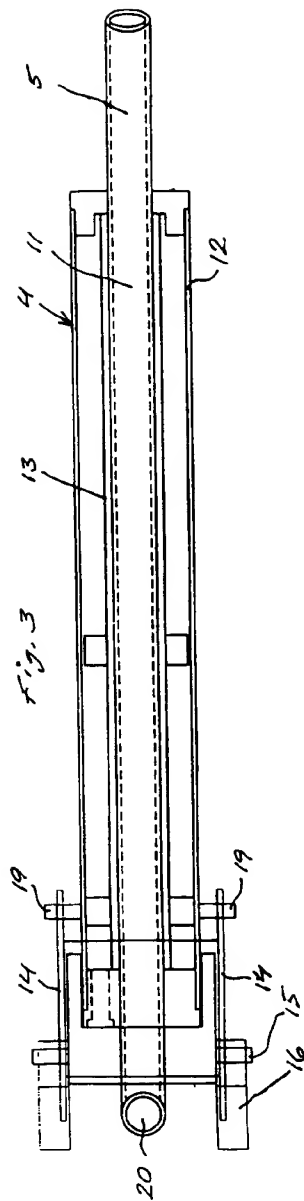
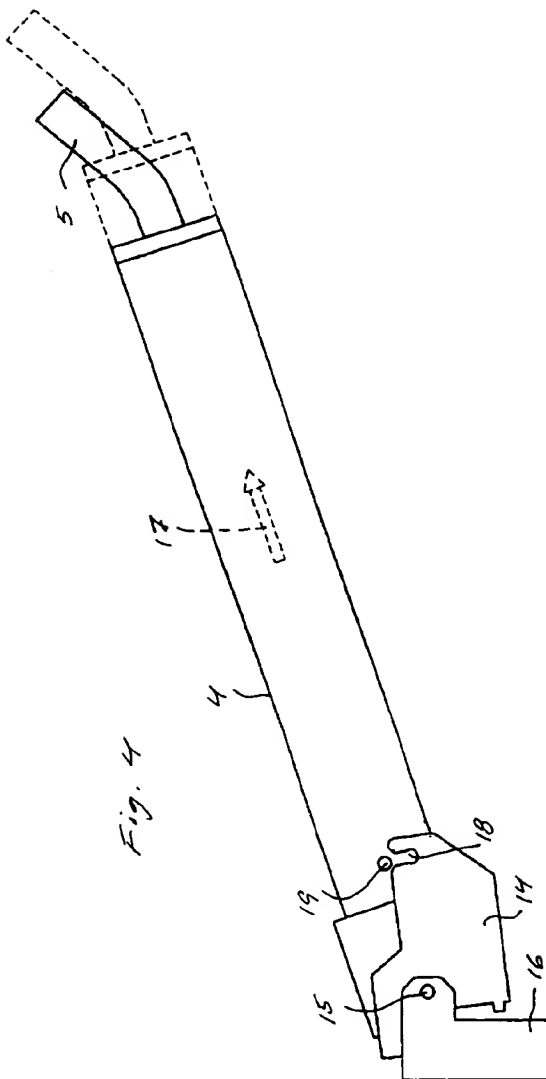


Fig. 3





INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 96/01369

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A01K 5/02, A01K 9/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A01K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT, USPM

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	SE 502006 C2 (U. BERGGVIST), 10 July 1995 (10.07.95), figure 1, claim 1 --	1-3
Y	SE 445873 B (S.-E. SMEDS), 28 July 1986 (28.07.86), page 2, line 24 - line 27; page 3, line 26 - line 32, figure 1 --	2
Y	DE 1168696 B (J.-F. BRAULT), 23 April 1964 (23.04.64), column 4, line 43 - line 48, figure 5 -- -----	3

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SE-C2- 502006	10/07/95	AU-A- 1594695	08/08/95
		AU-A- 6294094	11/10/94
		BR-A- 9406325	26/12/95
		EP-A- 0693912	31/01/96
		JP-T- 8509879	22/10/96
		SE-A- 9400208	10/07/95
		WO-A- 9519701	27/07/95
SE-B- 445873	28/07/86	AU-B- 573822	23/06/88
		AU-A- 4210785	01/11/85
		CA-A- 1237030	24/05/88
		EP-A,B- 0210167	04/02/87
		JP-B- 4058297	17/09/92
		JP-T- 61501610	07/08/86
		SE-A- 8401723	29/09/85
		SU-A- 1442062	30/11/88
		US-A- 4653432	31/03/87
		WO-A- 8504305	10/10/85
DE-B- 1168696	23/04/64	NONE	